

=====

Sequence Listing was accepted.

See attached Validation Report.

If you need help call the Patent Electronic Business Center at (866)
217-9197 (toll free).

Reviewer: Keisha Douglas

Timestamp: Wed Sep 05 11:18:02 EDT 2007

=====

Application No: 09917376 Version No: 2.1

Input Set:

Output Set:

Started: 2007-09-05 11:17:41.578
Finished: 2007-09-05 11:17:42.237
Elapsed: 0 hr(s) 0 min(s) 0 sec(s) 659 ms
Total Warnings: 0
Total Errors: 0
No. of SeqIDs Defined: 8
Actual SeqID Count: 8

SEQUENCE LISTING

<110> National Renewable Energy Laboratory

<120> Thermal Tolerant Avicelase From Acidothermus cellulolyticus

<130> NREL 01-36

<140> 09/917,376

<141> 2001-07-28

<160> 8

<170> PatentIn version 3.4

<210> 1

<211> 957

<212> PRT

<213> Acidothermus cellulolyticus

<220>

<221> misc_feature

<222> (957)..(957)

<223> Xaa can be any naturally occurring amino acid

<400> 1

Met Asp Arg Ser Glu Asn Ile Arg Leu Thr Met Arg Ser Arg Arg Leu
1 5 10 15

Val Ser Leu Leu Ala Ala Thr Ala Ser Phe Ala Val Ala Ala Ala Leu
20 25 30

Gly Val Leu Pro Ile Ala Ile Thr Ala Ser Pro Ala His Ala Ala Thr
35 40 45

Thr Gln Pro Tyr Thr Trp Ser Asn Val Ala Ile Gly Gly Gly Gly Phe
50 55 60

Val Asp Gly Ile Val Phe Asn Glu Gly Ala Pro Gly Ile Leu Tyr Val
65 70 75 80

Arg Thr Asp Ile Gly Gly Met Tyr Arg Trp Asp Ala Ala Asn Gly Arg
85 90 95

Trp Ile Pro Leu Leu Asp Trp Val Gly Trp Asn Asn Trp Gly Tyr Asn
100 105 110

Gly Val Val Ser Ile Ala Ala Asp Pro Ile Asn Thr Asn Lys Val Trp

115

120

125

Ala Ala Val Gly Met Tyr Thr Asn Ser Trp Asp Pro Asn Asp Gly Ala
130 135 140

Ile Leu Arg Ser Ser Asp Gln Gly Ala Thr Trp Gln Ile Thr Pro Leu
145 150 155 160

Pro Phe Lys Leu Gly Gly Asn Met Pro Gly Arg Gly Met Gly Glu Arg
165 170 175

Leu Ala Val Asp Pro Asn Asn Asp Asn Ile Leu Tyr Phe Gly Ala Pro
180 185 190

Ser Gly Lys Gly Leu Trp Arg Ser Thr Asp Ser Gly Ala Thr Trp Ser
195 200 205

Gln Met Thr Asn Phe Pro Asp Val Gly Thr Tyr Ile Ala Asn Pro Thr
210 215 220

Asp Thr Thr Gly Tyr Gln Ser Asp Ile Gln Gly Val Val Trp Val Ala
225 230 235 240

Phe Asp Lys Ser Ser Ser Ser Leu Gly Gln Ala Ser Lys Thr Ile Phe
245 250 255

Val Gly Val Ala Asp Pro Asn Asn Pro Val Phe Trp Ser Arg Asp Gly
260 265 270

Gly Ala Thr Trp Gln Ala Val Pro Gly Ala Pro Thr Gly Phe Ile Pro
275 280 285

His Lys Gly Val Phe Asp Pro Val Asn His Val Leu Tyr Ile Ala Thr
290 295 300

Ser Asn Thr Gly Gly Pro Tyr Asp Gly Ser Ser Gly Asp Val Trp Lys
305 310 315 320

Phe Ser Val Thr Ser Gly Thr Trp Thr Arg Ile Ser Pro Val Pro Ser
325 330 335

Thr Asp Thr Ala Asn Asp Tyr Phe Gly Tyr Ser Gly Leu Thr Ile Asp
340 345 350

Arg Gln His Pro Asn Thr Ile Met Val Ala Thr Gln Ile Ser Trp Trp
355 360 365

Pro Asp Thr Ile Ile Phe Arg Ser Thr Asp Gly Gly Ala Thr Trp Thr
370 375 380

Arg Ile Trp Asp Trp Thr Ser Tyr Pro Asn Arg Ser Leu Arg Tyr Val
385 390 395 400

Leu Asp Ile Ser Ala Glu Pro Trp Leu Thr Phe Gly Val Gln Pro Asn
405 410 415

Pro Pro Val Pro Ser Pro Lys Leu Gly Trp Met Asp Glu Ala Met Ala
420 425 430

Ile Asp Pro Phe Asn Ser Asp Arg Met Leu Tyr Gly Thr Gly Ala Thr
435 440 445

Leu Tyr Ala Thr Asn Asp Leu Thr Lys Trp Asp Ser Gly Gly Gln Ile
450 455 460

His Ile Ala Pro Met Val Lys Gly Leu Glu Glu Thr Ala Val Asn Asp
465 470 475 480

Leu Ile Ser Pro Pro Ser Gly Ala Pro Leu Ile Ser Ala Leu Gly Asp
485 490 495

Leu Gly Gly Phe Thr His Ala Asp Val Thr Ala Val Pro Ser Thr Ile
500 505 510

Phe Thr Ser Pro Val Phe Thr Thr Gly Thr Ser Val Asp Tyr Ala Glu
515 520 525

Leu Asn Pro Ser Ile Ile Val Arg Ala Gly Ser Phe Asp Pro Ser Ser
530 535 540

Gln Pro Asn Asp Arg His Val Ala Phe Ser Thr Asp Gly Gly Lys Asn
545 550 555 560

Trp Phe Gln Gly Ser Glu Pro Gly Gly Val Thr Thr Gly Gly Thr Val
565 570 575

Ala Ala Ser Ala Asp Gly Ser Arg Phe Val Trp Ala Pro Gly Asp Pro		
580	585	590
Gly Gln Pro Val Val Tyr Ala Val Gly Phe Gly Asn Ser Trp Ala Ala		
595	600	605
Ser Gln Gly Val Pro Ala Asn Ala Gln Ile Arg Ser Asp Arg Val Asn		
610	615	620
Pro Lys Thr Phe Tyr Ala Leu Ser Asn Gly Thr Phe Tyr Arg Ser Thr		
625	630	635 640
Asp Gly Gly Val Thr Phe Gln Pro Val Ala Ala Gly Leu Pro Ser Ser		
645	650	655
Gly Ala Val Gly Val Met Phe His Ala Val Pro Gly Lys Glu Gly Asp		
660	665	670
Leu Trp Leu Ala Ala Ser Ser Gly Leu Tyr His Ser Thr Asn Gly Gly		
675	680	685
Ser Ser Trp Ser Ala Ile Thr Gly Val Ser Ser Ala Val Asn Val Gly		
690	695	700
Phe Gly Lys Ser Ala Pro Gly Ser Ser Tyr Pro Ala Val Phe Val Val		
705	710	715 720
Gly Thr Ile Gly Gly Val Thr Gly Ala Tyr Arg Ser Asp Asp Cys Gly		
725	730	735
Thr Thr Trp Val Leu Ile Asn Asp Asp Gln His Gln Tyr Gly Asn Trp		
740	745	750
Gly Gln Ala Ile Thr Gly Asp His Ala Asn Leu Arg Arg Val Tyr Ile		
755	760	765
Gly Thr Asn Gly Arg Gly Ile Val Tyr Gly Asp Ile Gly Gly Ala Pro		
770	775	780
Ser Gly Ser Pro Ser Pro Ser Val Ser Pro Ser Ala Ser Pro Ser Leu		
785	790	795 800

Ser Pro Ser Pro Ser Pro Ser Ser Ser Pro Ser Pro Ser Pro Ser Pro
805 810 815

Ser Ser Ser Pro Ser Ser Ser Pro Ser Pro Ser Pro Ser Pro Ser Pro
820 825 830

Ser Pro Ser Arg Ser Pro Ser Pro Ser Ala Ser Pro Ser Pro Ser Ser
835 840 845

Ser Pro Ser Pro Ser Ser Ser Pro Ser Ser Ser Pro Ser Pro Thr Pro
850 855 860

Ser Ser Ser Pro Val Ser Gly Gly Val Lys Val Gln Tyr Lys Asn Asn
865 870 875 880

Asp Ser Ala Pro Gly Asp Asn Gln Ile Lys Pro Gly Leu Gln Val Val
885 890 895

Asn Thr Gly Ser Ser Ser Val Asp Leu Ser Thr Val Thr Val Arg Tyr
900 905 910

Trp Phe Thr Arg Asp Gly Gly Ser Ser Thr Leu Val Tyr Asn Cys Asp
915 920 925

Trp Ala Ala Ile Gly Cys Gly Asn Ile Arg Ala Ser Phe Gly Ser Val
930 935 940

Asn Pro Ala Thr Pro Thr Ala Asp Thr Tyr Leu Gln Xaa
945 950 955

<210> 2
<211> 2869
<212> DNA
<213> Acidothermus cellulolyticus

<220>
<221> misc_feature
<222> (2869)..(2869)
<223> n is a, c, g, or t

<400> 2
atggatcggt cggagaacat ccgtctgact atgagatcac gacgattggt atcactgctc 60
gccgccactg cgtcgttcgc cgtggccgcc gctctgggag ttctgcccat cgcgataacg 120
gcttctcctg cgcacgcggc gacgactcag ccgtacacct ggagcaacgt ggcgatcggg 180

ggcggcggtt	ttgtcgacgg	gatcgtcttc	aatgaagggtg	caccgggaat	tctgtacgtg	240
cggacggaca	tcggggggat	gtatcgatgg	gatgccgcca	acgggcggtg	gatccctctt	300
ctggattggg	tgggatggaa	caattggggg	tacaacggcg	tcgtcagcat	tgcggcagac	360
ccgatcaata	ctaacaaggt	atggggcgcc	gtcggaatgt	acaccaacag	ctgggacca	420
aacgacggag	cgattctccg	ctcgtctgat	cagggcgcaa	cgtggcaaat	aacgcccttg	480
ccgttcaagc	ttggcggcaa	catgcccggg	cgtggaatgg	gcgagcggt	tgcggtggat	540
ccaaacaatg	acaacattct	gtatttcggc	gccccgagcg	gcaaagggt	ctggagaagc	600
acagattccg	gcgcgacctg	gtcccagatg	acgaactttc	cggacgtagg	cacgtacatt	660
gcaaatccca	ctgacacgac	cggctatcag	agcgatattc	aaggcgctcg	ctgggtcgct	720
ttcgacaagt	cttcgtcatc	gctcgggcaa	gcgagtaaga	ccatttttgt	gggcgtggcg	780
gatcccaata	atccggtctt	ctggagcaga	gacggcggtg	cgacgtggca	ggcgtgccg	840
ggtgcgccga	ccggcttcat	cccgcacaag	ggcgtctttg	acccggtcaa	ccacgtgctc	900
tatatggcca	ccagcaatac	gggtgggtccg	tatgacggga	gctccggcga	cgtctggaaa	960
ttctcgggtg	cctccgggac	atggacgcga	atcagcccg	taccttcgac	ggacacggcc	1020
aacgactact	ttggttacag	cggcctcact	atcgaccgcc	agcaccgaa	cacgataatg	1080
gtggcaaccc	agatatcgtg	gtggccggac	accataatct	ttcggagcac	cgacggcggt	1140
gcgacgtgga	cgcggatctg	ggattggacg	agttatccca	atcgaagctt	gcgatatgtg	1200
cttgacattt	cggcggagcc	ttggctgacc	ttcggcgtag	agccgaatcc	tcccgtaccc	1260
agtccgaagc	tgggtggat	ggatgaagcg	atggcaatcg	atccgttcaa	ctctgatcgg	1320
atgctctacg	gaacaggcgc	gacgttgtac	gcaacaaatg	atctcacgaa	gtgggactcc	1380
ggcggccaga	ttcatatcgc	gccgatggtc	aaaggattgg	aggagacggc	ggtaaacgat	1440
ctcatcagcc	cgcggtctgg	cgccccgctc	atcagcgtc	tcggagacct	cggcggcttc	1500
accacgccg	acgttactgc	cgtgccatcg	acgatcttca	cgtcaccggt	gttcacgacc	1560
ggcaccagcg	tgcactatgc	ggaattgaat	ccgtcgatca	tcgttcgcgc	tggaagtttc	1620
gatccatcga	gccaaccgaa	cgacaggcac	gtcgcgttct	cgacagacgg	cggcaagaac	1680
tggttccaag	gcagcgaacc	tggcggggtg	acgacgggcg	gcaccgtcgc	cgcacgggcc	1740
gacggctctc	gtttcgtctg	ggctcccggc	gatcccggtc	agcctgtggt	gtacgcagtc	1800
ggatttggca	actctgggc	tgcttcgcaa	ggtgttccc	ccaatgcca	gatccgctca	1860

gaccgggtga atccaaagac tttctatgcc ctatccaatg gaaccttcta tcgaagcacg 1920
gacggcgcg tgacattcca accggtcgcg gccggtcttc cgagcagcgg tgccgtcgg 1980
gtcatgttcc acgcggtgcc tggaaaagaa ggcgatctgt ggctcgctgc atcgagcggg 2040
ctttaccact caaccaatgg cggcagcagt tggctctgaa tcaccggcgt atcctccgcg 2100
gtgaacgtgg gatttggtaa gtctgcgcc gccgtcgtcat acccagccgt ctttgtcgtc 2160
ggcagcatcg gaggcgttac gggggcgtag cgctccgacg actgtgggac gacctgggta 2220
ctgatcaatg atgaccagca ccaatacggg aattggggac aagcaatcac cggtgaccac 2280
gcgaatttac ggcggtgtga cataggcacg aacggccgtg gaattgtata cggggacatt 2340
ggtggtgcgc cgtccggatc gccgtctccg tcggtgagtc cgtcggcttc gccgagcctg 2400
agcccgagcc cgagcccgag cagctcgcca tcgccgtcgc cgtcggcgag ctcgagtcca 2460
tcctcgtcgc cgtctccgtc gccgtcacca tcgccgagtc cgtctcggtc tccgtcacca 2520
tcggcgtcgc cgagcccgtc ttcgtcaccg agcccgctt cgtcacccgc ttcgtcgccg 2580
agcccaacgc cgtcgtcgtc gccggtgtcg ggtggggtga aggtgcagta taagaataat 2640
gattcggcgc cgggtgataa tcagatcaag ccgggtttgc aggtggtgaa taccgggtcg 2700
tcgtcgggtg atttgtcgac ggtgacggtg cgggtactgg tcacccggga tgggtggctcg 2760
tcgacactgg tgtacaactg tgactgggcg gcgatcgggt gtgggaatat ccgcgcctcg 2820
ttcggtcgg tgaaccggc gacgcgacg gcggacacct acctgcagn 2869

<210> 3

<211> 740

<212> PRT

<213> Acidothermus cellulolyticus

<400> 3

Ala Thr Thr Gln Pro Tyr Thr Trp Ser Asn Val Ala Ile Gly Gly Gly
1 5 10 15

Gly Phe Val Asp Gly Ile Val Phe Asn Glu Gly Ala Pro Gly Ile Leu
20 25 30

Tyr Val Arg Thr Asp Ile Gly Gly Met Tyr Arg Trp Asp Ala Ala Asn
35 40 45

Gly Arg Trp Ile Pro Leu Leu Asp Trp Val Gly Trp Asn Asn Trp Gly
50 55 60

Tyr Asn Gly Val Val Ser Ile Ala Ala Asp Pro Ile Asn Thr Asn Lys			
65	70	75	80
Val Trp Ala Ala Val Gly Met Tyr Thr Asn Ser Trp Asp Pro Asn Asp			
85	90	95	
Gly Ala Ile Leu Arg Ser Ser Asp Gln Gly Ala Thr Trp Gln Ile Thr			
100	105	110	
Pro Leu Pro Phe Lys Leu Gly Gly Asn Met Pro Gly Arg Gly Met Gly			
115	120	125	
Glu Arg Leu Ala Val Asp Pro Asn Asn Asp Asn Ile Leu Tyr Phe Gly			
130	135	140	
Ala Pro Ser Gly Lys Gly Leu Trp Arg Ser Thr Asp Ser Gly Ala Thr			
145	150	155	160
Trp Ser Gln Met Thr Asn Phe Pro Asp Val Gly Thr Tyr Ile Ala Asn			
165	170	175	
Pro Thr Asp Thr Thr Gly Tyr Gln Ser Asp Ile Gln Gly Val Val Trp			
180	185	190	
Val Ala Phe Asp Lys Ser Ser Ser Ser Leu Gly Gln Ala Ser Lys Thr			
195	200	205	
Ile Phe Val Gly Val Ala Asp Pro Asn Asn Pro Val Phe Trp Ser Arg			
210	215	220	
Asp Gly Gly Ala Thr Trp Gln Ala Val Pro Gly Ala Pro Thr Gly Phe			
225	230	235	240
Ile Pro His Lys Gly Val Phe Asp Pro Val Asn His Val Leu Tyr Ile			
245	250	255	
Ala Thr Ser Asn Thr Gly Gly Pro Tyr Asp Gly Ser Ser Gly Asp Val			
260	265	270	
Trp Lys Phe Ser Val Thr Ser Gly Thr Trp Thr Arg Ile Ser Pro Val			
275	280	285	

Pro Ser Thr Asp Thr Ala Asn Asp Tyr Phe Gly Tyr Ser Gly Leu Thr
290 295 300

Ile Asp Arg Gln His Pro Asn Thr Ile Met Val Ala Thr Gln Ile Ser
305 310 315 320

Trp Trp Pro Asp Thr Ile Ile Phe Arg Ser Thr Asp Gly Gly Ala Thr
325 330 335

Trp Thr Arg Ile Trp Asp Trp Thr Ser Tyr Pro Asn Arg Ser Leu Arg
340 345 350

Tyr Val Leu Asp Ile Ser Ala Glu Pro Trp Leu Thr Phe Gly Val Gln
355 360 365

Pro Asn Pro Pro Val Pro Ser Pro Lys Leu Gly Trp Met Asp Glu Ala
370 375 380

Met Ala Ile Asp Pro Phe Asn Ser Asp Arg Met Leu Tyr Gly Thr Gly
385 390 395 400

Ala Thr Leu Tyr Ala Thr Asn Asp Leu Thr Lys Trp Asp Ser Gly Gly
405 410 415

Gln Ile His Ile Ala Pro Met Val Lys Gly Leu Glu Glu Thr Ala Val
420 425 430

Asn Asp Leu Ile Ser Pro Pro Ser Gly Ala Pro Leu Ile Ser Ala Leu
435 440 445

Gly Asp Leu Gly Gly Phe Thr His Ala Asp Val Thr Ala Val Pro Ser
450 455 460

Thr Ile Phe Thr Ser Pro Val Phe Thr Thr Gly Thr Ser Val Asp Tyr
465 470 475 480

Ala Glu Leu Asn Pro Ser Ile Ile Val Arg Ala Gly Ser Phe Asp Pro
485 490 495

Ser Ser Gln Pro Asn Asp Arg His Val Ala Phe Ser Thr Asp Gly Gly
500 505 510

Lys Asn Trp Phe Gln Gly Ser Glu Pro Gly Gly Val Thr Thr Gly Gly

515

520

525

Thr Val Ala Ala Ser Ala Asp Gly Ser Arg Phe Val Trp Ala Pro Gly
530 535 540

Asp Pro Gly Gln Pro Val Val Tyr Ala Val Gly Phe Gly Asn Ser Trp
545 550 555 560

Ala Ala Ser Gln Gly Val Pro Ala Asn Ala Gln Ile Arg Ser Asp Arg
565 570 575

Val Asn Pro Lys Thr Phe Tyr Ala Leu Ser Asn Gly Thr Phe Tyr Arg
580 585 590

Ser Thr Asp Gly Gly Val Thr Phe Gln Pro Val Ala Ala Gly Leu Pro
595 600 605

Ser Ser Gly Al